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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/645,781 | 08/22/2003 | Perry Robert Czimmek | 051252-5217-01 | 8076 |

9629 7590 03/24/2005

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WASHINGTON, DC 20004

EXAMINER

HOGAN, JAMES SEAN

ART UNIT PAPER NUMBER

3752

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|-----------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/645,781 | CZIMMEK, PERRY ROBERT | |
| | Examiner | Art Unit | |
| | James S Hogan | 3752 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17, 18 and 20-22 is/are rejected.
- 7) ☒ Claim(s) 19 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>08/22/2003</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 17- rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,235,954 to Svendin in view of U.S. Patent No. 6,481,421 to Reiter and further in view of U.S. Patent No. 2,846,028 to Gunther.

3. Regarding claim 1, Svendin teaches a fuel injector having a body having an inlet port (14), an outlet port (20) and a fuel passageway (16) extending from the inlet port to the outlet port along a longitudinal axis. Also included are, a metering element (50) disposed proximate the outlet port and an actuation element (43) having a proximal end and a distal end, the proximal end being in operative contact with the metering element. The fuel injector of Svendin also features an electromagnetic coil, and a compensator (58) being coupled to the distal end of the actuation element. The compensator contains magnetically active fluid (Column 8, lines 11-25) and the magnetically active fluid is responsive to magnetic flux so as to change the fluid from a first state to a second state (Column 12, lines 2-5). As per claim 21, Svendin provides a magnetostrictive member (40) and piezoelectric stack (63). Svendin does not teach the compensator having a plunger disposed in a sleeve, with clearance between the plunger and the sleeve. Reiter ('421) teaches a sleeve (30) surrounding a plunger (4),

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with a clearance (shown in Fig. 1, not numbered) between the plunger and the sleeve.

Svendin also does not teach the ability to maintain one end of the actuation element constant with respect to the compensator when the magnetic flux is generated.

Gunther ('028) teaches a dampening device where, when magnetic flux is generated, an actuation element (piston 2) is held in place with respect with the rest of the dampening device. As per claim 18, 20 and 22, Gunther describes the ability to change the viscosity of the magnetically-active fluid when flux is introduced (by energizing an electromagnetic coil), and thus reduces the movement of the fluid ((col. 2, lines 8-36). Thus it would have been obvious to one skilled in the art at the time the invention was made to have supported an actuator element in a fuel injector by modifying the plunger in the compensator of Svendin with the sleeve of Reiter ('421) and applying the magnetostrictive lessons taught by Gunther in order to actuate the flow of fuel within the injector.

Allowable Subject Matter

4. Claims 19 and 23 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is as follows:

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U.S. Patent No. 6,425,375 to Hefler et al, disclosing a fuel injector

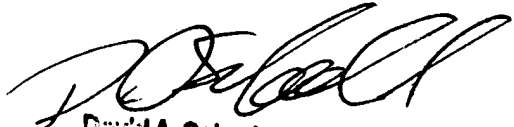
U.S. Patent No. 6,474,598 to Carter et al., disclosing a dampening device

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S Hogan whose telephone number is (571) 272-4902. The examiner can normally be reached on Mon-Fri, 7:00a-4:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Scherbel can be reached on (571) 272-4919. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JSH
03/17/2005


David A. Scherbel
Supervisory Patent Examiner
Group 3700